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APPLICATION FOR LETTERS PATENT

for

MICROWAVE MILK JUG AND METHOD TO BOIL MILK OR SIMILAR DRINKS
IN MICROWAVE JUGS

Inventor:
Helio Vieira Alves

Attorney:
G. Scott Dorland, Ph.D.
Registration No. 51,622
TRASKBRITT, PC
P.O. Box 2550
Salt Lake City, Utah 84110
(801) 532-1922

TITLE OF THE INVENTION

MICROWAVE MILK JUG AND METHOD TO BOIL MILK OR SIMILAR DRINKS
IN MICROWAVE JUGS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of International Application No. PCT/BR02/00016, filed January 31, 2002, which is a continuation of Brazilian Application No. PI 0003261, filed February 1, 2001, which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention consists of a microwave (oven)-driven milk boiling device, useful to boil natural milk or milk-powder or to make chocolate or similar items, or even to boil water; being the boiling made under pressure and during a pre-determinate time, the jug being further useful to serve the boiled milk and the like directly to the table, having an efficient use.

[0003] The invention is a new, since there is no notice of a similar domestic or foreign jug for use in microwave oven, as conceived.

[0004] As is well-known, milk usually is brought to a boil under fire action and when reaching boiling point, the liquid comes to ebullition and grows in volume, thereby forming gaseous bubbles which rise within the container, which is then removed from the fire to prevent spillage. It is from the state of art a milk jug that uses a cone within a coverless pan-shaped container, which allows the milk to remain boiling, both in the fire and in a microwave oven.

[0005] The present invention brings milk to a boil in a filed container and places the already boiled milk in another container, within a period of two minutes, which may vary depending on the microwave oven used. The milk placed in the second container does not spill, because this container contains walls, bottom and a plastic-covered aluminum cap, proper to use in microwave and for food.

[0006] The heat is until the boiling point occurs because, under microwave action, friction of mixed liquid and solid molecules is initiated and, with the boiling, steam is formed with a sufficient force to impel the liquid from the bottom container through two sequential

tubes, to fall into the upper container, ready to serve at the table and where the liquid is most re-boiled due to the aluminum protection of the upper container.

[0007] Both pure milk and chocolate can be boiled likewise, after adding powder to cold or warm milk.

[0008] Likewise, it is also possible to prepare milk with water and milk-powder, and further cappuccino or coffee with milk-powder, simply adding powder to cold or warm water and then operating the microwave oven for the same period of time as to boil natural milk.

[0009] Thus, one may obtain perfectly sterilized liquids in an adequate form for alimentation, especially for babies, when milk-powder is used and that, in order to become pure, must be prepared in sterilized water.

DESCRIPTION OF MATERIAL USED AND PARTS

[0010] MATERIALS: In the making of parts to be described below, microwave oven-resistant and proper to food materials are used the internal walls of the serving container 19' being made in aluminum and covered with plastic; in all parts, plastic (Polyeter Imida PEI) will be used since the material is unbreakable, transparent resistant to high temperatures, proper for microwaves and meets FDA standards in USA, or other standards produced in Brazil or abroad, which may have at least the same technical specifications as that.

[0011] PARTS: BOILING CONTAINER 19 - (FIGURE 2 - Cross-section and FIGURE 3 - Topview): a, cylinder-shaped plastic container having – a first opening 21 in the first upper part 23 with about 9 cm diameter; at the external part near that first opening 21 it has four points in solid cubic format 1, with face with about 10,5mm, and which will serve to fasten this part to the SERVING CONTAINER 19' (see FIGURE 4); it has a base 3 with about 0,5 cm height, formed by the extension of its side walls 22 beyond the bottom 24; and in this side wall 22, near to the first opening 21, it has a minuscule excavated space 52 with the same thickness as this side wall 22, in a concave half-sphere format, with the larger diameter (0,5mm) turned outwards, intended to form a Safety Valve together with the external piece 25, which is a rectangular lug-shaped fixed support, where the part named PRESSURE SEALING 50 (see FIGURE 8) will fit.

[0012] SERVING CONTAINER 19' - (FIGURE 4 - Cross-section and FIGURE 5 - Topview section): an aluminum mug-shaped cylindrical container 4 entirely covered with plastic, containing a second opening 5 of about 9 cm diameter in the upper part, containing in the bottom 26 a hole 6 with approximately 1 cm diameter with plastic cylindrical walls 28 around it, which rise both from the bottom 26 to the internal part 7 for about 2 cm and, likewise, to the outside part, which serve to fasten the two liquid conducting tubes 40 and 40' as seen in FIGURE 6A and FIGURE 7A; it has further a small ring-shaped base 27 (extension of side walls beyond the bottom 26), containing L-shaped notches 8 and which will serve to fit the SERVING CONTAINER 19' (see FIGURE 2); it contains one external lug 9 to hold the MICROWAVE MILK JUG 30 (see FIGURE 1), which is hollowed in its horizontal parts 10 which connect it with the container 19'; and above, in the outside part, near the second opening 5, it has four 0.5mm points in a solid cubic format 11 which will serve to hold the MILK JUG CAP 20 (see FIGURE 10); it has further, in the upper part, one liquid outlet nozzle 12 to serve at the table.

[0013] LIQUID CONDUCTING TUBES 40 and 40' - (FIGURES 6A and 6B) - Cross - section and topview; and FIGURES 7A and 7B - Cross-section and topview): made in plastic in cylindrical format, with a size near containers 19, 19' height and diameter of about 1 cm. FIGURES 6A and 6B show the second tube conducting 40' that comprises outside pins 13 of solid cubic formats positioned at a first end 43, that fits the entrances 29 at the internal base of the cylindrical walls 28 of the SERVING CONTAINER 19' (see FIGURE 4); and in the first tube conducting 40 of FIGURES 7A and 7B, which, in addition to be equal to the second tube conducting 40', this first tube conducting 40 has outside pins 13 of solid cubic formats positioned at its second final part 42 and fit to the base of the cylindrical walls 28 externally located from the bottom 26 center of the SERVING CONTAINER 19' (see FIGURE 4), further this first tube conducting 40 has two rectangular notches 14 around its first final part 41 of its mouth which will serve for entrance of liquids, which will be done under pressure.

[0014] In the occasional obstruction of the first tube conducting 40, the safety valve of the BOILING CONTAINER 19 (see FIGURE 2) will be operated.

[0015] PRESSURE SEALING 50 - (FIGURE 8 - Cross-section and FIGURE 9 - topview section); a rectangle-shaped plastic piece, having in one of its ends and in the width part, the added format of a convex half-sphere 51, which will fit into the excavated space 52

existing in the side wall 22 near the first opening 21 of the BOILING CONTAINER 19 (see FIGURE 2) for sealing, and holding to the external lug as it is seen in MICROWAVE MILK JUG 30 (see FIGURE 1), thereby forming the Safety valve of this container 19.

[0016] SERVING CONTAINER CAP 20 - (FIGURE 10 - Cross-section and FIGURE 11 - topview section): made in plastic and cylindrical format, it contains in its upper part a round shape gripper 15 in order to grip it, and a cylinder-shaped side wall 17 containing four L-shaped hollows 16, intended to fit into the second opening 5 of the SERVING CONTAINER 19' (see FIGURE 4).

DETAILED DESCRIPTION OF THE INVENTION: FILLED BOILING CONTAINER 19 (see FIGURE 12); SERVING CONTAINER 19' WITH TUBES 40, 40' ADDED (see FIGURE 13); MILK JUG 30 READY TO BOIL (see FIGURE 14); MILK JUG 30 BOILING MILK (see FIGURE 15); MILK JUG 30 WITH BOILED MILK TO SERVE (see FIGURE 16).

[0017] MILK JUG 30 operation is now described, whose procedures are mostly common in its general use.

[0018] The BOILING CONTAINER 19 is taken at normal position that is, with first opening 21 upwards, and places in it natural milk or previously mixed with filtered water or chocolate or chocolate products, or cappuccino powder, or coffee powder with milk, in the recommended measures, and mixing until dissolved, the same procedures to fill as shown in FIGURE 2 being allowed.

[0019] The objective to obtaining the liquid boiled and sterilized to drink. Then, as it is seen in FIGURE 13, one places the two liquid conducting tubes 40 and 40' which are fastened to the bottom 26 of the SERVING CONTAINER 19', in its internal and external parts; afterwards, as is shown in FIGURE 14, the two containers 19 and 19' are fitted axially positioned and the CAP 20 is placed into the SERVING CONTAINER 19', the MILK JUG 30 begin ready to be taken to the microwave oven for the time stipulated, in this case, approximately two minutes.

[0020] As it can be seen in FIGURE 15 through indicative arrows, in the bottom part 3 of the BOILING CONTAINER, the liquid, through the action of microwaves, will start its boiling process that, in being in that, will produce the transformation of the liquid into steam, that in turn will be accumulated in the small empty space without milk, thereby producing

pressure for all sides, causing, by force of the pressure exercised, the liquid to leave by the only place possible, that is, the bottom 3 of the container, where the first tube conducting 40 notches 14 are located and in penetrating therein, it will rise by the first tube conducting 40 of this container 19 to the second tube conducting 40' in the SERVING CONTAINER 19' in order to beat its CAP 20 and falling therein under gravity, internally, ready to serve, as it is seen in FIGURE 16.

[0021] A table indicating heating time in relation to the temperature reached according to type or brand of the microwave oven used, and in accordance with the amount of liquid to be boiled, should be sold with some manual for user's guidance that, thus, will then know in a short period of time, the own table for the temperature x time to be used in his/her microwave oven.